Gateway

Volume 5
Number 13

March 17, 1989

The ARRL Packet-Radio Newsletter

ROSE SWITCH ON

The long awaited ROSE (RATS Open Systems Environment) X.25 Packet Switch software has been released by The Radio Amateur Telecommunications Society (RATS). This release of the ROSE Switch software runs in a TNC 2 (or clone) or in a PacComm DR-200 two-port controller. TNC 2s may also be operated in a "back-to-back" configuration. The software was written by Tom Moulton, W2VY, and is free, for Amateur Radio use only. It may be obtained by downloading it from CompuServe's HamNet (filename: ROSESW.ARC).

from J. Gordon Beattie, Jr, N2DSY
via CompuServe's HamNet

TAPR FOCUSES ON ON-GOING PROJECTS AT ANNUAL MEETING

The board and members of Tucson Amateur Packet Radio (TAPR) met on February 24-26 in Tuscon, Arizona, to discuss activities of the past and forthcoming year. Heavy TAPR support, both financial and technical, for AMSAT's MicroSat project has been the major activity of the past year, followed closely by the digital signal processing (DSP) project (see *Gateway*, Volume 4, Numbers 4, 8 and 12 and Volume 5, Number 10). While the MicroSat project should be winding down after launch in a few months, the DSP project should "ramp up" toward production of DSP units.

Other TAPR projects discussed at the meeting included modem upgrade retrofits for the TNC 2 and an upgrade to the TNC 1 to allow it to run TNC 2 firmware (see *Gateway*, Volume 5, Number 9).

Numerous talks were given, including updates on TexNet, TCP/IP, MicroSat, DSP and the HF message-forwarding network. Technical talks introduced a prototype IBM PC plug-in compatible intelligent packet-radio controller by Mike Chepponis, K3MC; a DSP-based analysis by Dan Morrison, KV7B, of filter-type vs phase-locked loop FSK demodulators; and prototype 1.2-GHz transverters designed by Glenn Elmore, N6GN, for use with WA4DSY 56-kbit/s modems.

The theme of the weekend, or, at least, the most discussed subject, was TAPR's support for some type of new Amateur Radio license class that does not require a knowledge of Morse code. The TAPR board of directors, which met on the 24th and 25th, appointed Harold Price, NK6K, to oversee the generation of a specific proposal by TAPR. That proposal is to be forwarded to the ARRL No-Code Study Committee.

Newly elected TAPR board of directors were announced: Franklin Antonio, N6NKF; Bdale Garbee, N3EUA; Steve Goode, K9NG; Eric Gustafson, N7CL; and Lyle Johnson, WA7GXD.

by Jon Bloom, KE3Z

CALL FOR PAPERS: ARRL COMPUTER NETWORKING CONFERENCE

The eighth ARRL Amateur Radio Computer Networking Conference will be held on Saturday, October 7, 1989, at the Air Force Academy in Colorado Springs, Colorado. Technical papers are invited on all aspects of Amateur Radio digital communications via ionospheric, tropospheric, meteor-scatter and satellite modes. Topics may include network development, architecture, protocols, standards, hardware, software, modulation and encoding schemes, applications, frequency planning and practical experience, such as traffic handling. Of particular interest are digital signal processing, digital speech and image transmission, and new space programs employing digital communications.

Prospective contributors should request an author's kit and identify the topic of their paper immediately. The deadline for receipt of camera-ready manuscripts is August 28, 1989. Author kit requests and camera-ready manuscripts should be mailed to Lori Weinberg at ARRL headquarters.

Printed proceedings will be available at the conference and by mail from ARRL headquarters.

PACKET RADIO IN WEST GERMANY

In the following exclusive *Gateway* report, Ekki Plicht, DF4OR, the official in charge of visual communications for Deutscher Amateur Radio Club (DARC), describes the state of the art of amateur packet radio in the Federal Republic of Germany, where it is one of the fastest growing, if not the fastest growing, Amateur radio mode.

In the Beginning...

Packet radio in DL-land started on one 2-meter frequency, 144.675 MHz. While some enthusiasts enjoyed a quiet frequency and made connections through the whole country, even DX contacts into France, Switzerland and Austria, the growing interest in this new form of communications made efficient "normal" digipeating impossible, due to the increase in the number of collisions. So, in those early years, DARC started to develop a plan which would offer reliability and promise for future years. This plan stated that

- On 2 meters there are too few frequencies for packet radio (exactly three for digital communications);
- Therefore, user input frequencies should be placed on 70 cm and higher;
- Internode communications should take place on 23 cm and higher and the link between two nodes should be exclusive and realized with directional antennas and the lowest power possible.

This scheme developed well, although some people still favor 2-meter operation due to availability of less expensive equipment.

To understand the situation in West Germany, let me explain some of the more important differences between West Germany and US. The 2-meter band is much smaller than in the US (only 2 MHz, from 144.000 to 146.000 MHz). Digital communications occur from 144.625 to 144.675 and 145.300 MHz. This is not enough for a network, since there are still other digital activities besides packet radio, such as RTTY, FAX, etc.

On the average, West Germany is more densely inhabited than the US, thus, a digipeater has to serve a greater number of users. To avoid collisions between digipeaters serving different areas on the same frequency, they should not be located at good DX sites. Therefore, it is necessary to install a large number of medium-range digipeaters in order to build a nationwide network. This is possible only on 70 cm, where enough room is available (10 MHz, 430.000 to 440.000 MHz). (There is no 220-MHz band in Region 1, and 6-meter operation is not allowed in West Germany.)

The Situation Today

In early 1989, 74 digipeaters and 24 PBBSs are active in West Germany. Three digipeaters are still on 2 meters, the so called "NORD><LINK experiment." These are some of the earliest digipeaters in West Germany which were set up to learn about utilization of the 2-meter band for packet radio. Except for one station on 23 cm (a user input), all of the other stations are on 70 cm. The subbands used on 70 cm are:

- o 433.625-433.775 MHz: simplex, digipeater, station-to-station
- o 438.025-438.175 MHz: simplex, PBBS, digipeater, station-to-station
- o 438.200-438.525 MHz: duplex output, 7.6-MHz shift, digipeater (not yet in use)

Duplex digipeaters are preferred for their improved throughput and collision avoidance, even though they consume twice the space. Besides, they are a perfect way to defend our endangered 70-cm band. (For a fair presentation of the situation here, it must be said that ATV operators are not happy with the frequency allocations in the upper part of the 70-cm band.)

All nodes use 1200-bit/s modems on the user frequencies with one experimental station near Bonn using 4800-bit/s. Most digipeaters are connected to some other node via 23-cm links. There are still some links on 70 cm, but they will be moved to 23 cm or higher when possible. The 23-cm links are on exclusive duplex frequencies, so collisions should be minimal.

The necessity of using 23 cm for internode communication led to some interesting developments in UHF equipment. To name one, there is a reasonably-priced, one-watt transceiver kit developed by DF9IC and DL5UY from Karlsruhe, that is capable of 1200-bit/s, half-duplex operation. It is ready to connect to a 1200-bit/s AFSK modem and covers the 23-cm band from 1240 to 1300 MHz.

Many experiments are taking place on higher frequencies. For example, in the Munich area (Bavaria), some experiments are in progress using the 6-cm and 10-GHz bands.

Modem Hardware

Besides the standard 1200 bit/s modems using TCM3105, AMD7911 and XR2211 chips, there are other modem developments. DJ4ZC of AMSAT-DL has developed the "RSM-Modem" which uses rectangular spectrum modulation. It is capable of 9600 bit/s full-duplex operation and is under test on two digipeaters. NORD><LINK's DK4EG has developed a 4800-bit/s modem. Elsewhere, tests are being conducted with G3RUH's 9600-bit/s modems.

Digital Hardware...on Hilltops

About 50% of the digipeaters in West Germany use standard TNCs including many compatible clones of the well-known TNC 2. Most, if not all, use NET/ROM or TheNet.

Another large number of digipeaters use the so-called "RMNC" (Rhein-Main-Network Controller) which was developed by DH1FAB and others in Frankfurt. It uses the 6809 microprocessor and is contained on one printed circuit board that includes the CPU, 32-kbyte of RAM, 32-kbyte of ROM, SCC, VIA and a TCM3105 modem. It is available at a reasonable price.

A few digipeaters use homebuilt hardware or software. For example, the HP9000-series computers with homebuilt slot modems used in the Stuttgart area running UNIX, another 6809 system running FLEX, etc.

A large number of hams use the Commodore C-64 for packet-radio operation running DIGICOM>64 Version 2 software and an inexpensive user-port modem. Another large chunk of the packet-radio population use TNCs, PK-232s, KAMs or similiar controllers.

Digital Hardware To Come

Rumors concerning recent new hardware developments include a larger CPU for the RMNC by DG8FAC and another board for the RMNC using the H16-series computers by DK7WJ.

Software...on Hilltops

Nearly all of the TNC-equipped digipeaters use NET/ROM or TheNet. Plans are to further improve TheNet as far as code-space considerations will allow. The latest development for TNCs is a converse-mode EPROM from DL8ZAW which is linked to a NET/ROM node via the EIA RS-232-C interface.

Software that is available for the RMNC (RMNC V1.6) includes a simple tool that uses an unchanging routing table in EPROM with no hop-to-hop acknowledgement or connectability.

Another software design is DK7WJ's FLEXNET. It has a lot of capabilities including hop-to-hop acknowledgment (without changing the SSIDs), an information system, MHeard list, converse mode and more. Currently, it is used on one digipeater equipped with professional hardware (6809 multiprocessor), but it will be ported to the low-cost RMNC, resulting in the Version 2 of the RMNC software (whenever I finish the low-level I/O).

In Karlsruhe, DL5UY/N1EOV and DJØVL developed their own software running on an 68000 OS-9 system, incorporating a PBBS, standard digipeating and TCP/IP facilities based on KA9Q's software.

DK5SG developed another program under UNIX, running on a HP9000 series computer, which includes a PBBS, autorouter and, again, TCP/IP based on Phil's code. This is the so-called "WAMPES" (Wuertemberg Amateur Packet Experimental System). It is currently used by four or five stations in the Stuttgart area. WAMPES now has an extension which makes it compatible to NET/ROM-like internode communications (Layer 3/Layer 4 protocols). FLEXNET (and, by that, the RMNC) will follow by the summer of this year. Thus, we hope to get a consistent network all over the country.

The DARC department for visual communications will try to bring the major software developers of central Europe together for a conference where standardization and extension of the Layer 3/Layer 4 protocol will be discussed.

Software at Home

Many hams use the famous DIGICOM>64 software for the Commodore C-64/C-128 computers written by DL8MBT. Its capabilities and user interface is nearly unbeaten by any other software. It is also used in the US as well.

People who use TNCs are running TAPR (V1.1.4) or WA8DED (V2.1) firmware. The latter software has been rebuilt by the NORD><LINK group and is available under the name "TheFirmware." It has some nice improvements (clock, MHeard, KISS-mode) and is mostly used as host-mode software.

There are some host-mode programs for the IBM PC, for example, TURBO HOST by DL1BHO, PCT by DD6CV, and CTERM by DD5KZ. All of these use windowing, file I/O and enhance the TNC with many features. For the PK-232, there is PC-PAKRATT.

Most of the mentioned software and firmware is public domain. There is a little TCP/IP operation in West Germany, mainly in regions where a TCP/IP PBBS or digipeater is reachable. (One digipeater in West Germany is running KA9Q TCP/IP code.) Nevertheless, several hams have improved the KA9Q program with windowing (DK3SI) and other features (DK8GD).

PBBS Software

Until about a year and half ago, the WA7MBL PBBS software was used throughout Germany. But, then DF3AV, from the NORD><LINK group developed PBBS software called "DIEBOX" or "TheBox." Its greatest advantage is its multiuser capability that can handle up to eight users per TNC. This was badly needed for the crowded PBBSs serving hundreds of users in various regions of West Germany. Its store-and-forward scheme is compatible with the WA7MBL/WØRLI standard. The user interface uses a completely different approach than the WA7MBL PBBS. Another feature is its "lifetimer" which keeps the amount of information to a reasonable size. The average throughput of some mailboxes is approximately 75 Mbytes per month.

PBBSs running under UNIX or OS-9 (DK5SG and DL5UY) use improved WA7MBL software.

Packet Radio on HF

On HF, one mailbox is in operation: DKØMWX on 14.099 MHz. Most of our international traffic is handled through this mailbox, but, because of some legal uncertainty with third-party traffic, no direct contact is made between West Germany and US. We hope that will change in the future.

Many private stations are on 20 meters and should be operating below 14.099 MHz. The latest IARU Region 1 HF conference, held in late 1988, announced that a 100-kHz subband on 10 meters is allocated for narrow-band FM packet radio. This is from 29.200 to 29.300 kHz with 29.250 MHz as the center of activity.

Other Activities

A regular packet-radio conference is held in Frankfurt once a year. This meeting was attended by approximately 150 people last year, mainly PBBS SYSOPs and hardware/software developers. A beginners' conference was also held in Frankfurt in 1987 and should be repeated this year.

A software conference with a small circle of "gurus" is badly needed to catch up with the fast development of new software everywhere. It should ensure compatibility with all of the new programs without stopping anyone from writing new software or reinventing the wheel for the n+1 time.

The Future

We are far from having nationwide coverage by a packet-radio network, but the path seems clear. The number of new licenses for digipeaters has decreased a little, but some regions have not yet come on-line.

What we need now is to improve internode communications by means of hardware and software. The expected interest in packet radio indicates that the 1200-bit/s links are not fast enough. Roughly, about 10% (5000-plus hams) are QRV on packet radio and the number is still growing.

Again, to give a complete picture of the situation in West Germany, it must be said that not everyone is content with the concept that DARC has for packet radio. Also, there are people who think that packet radio has nothing to do with good ol' ham radio at all and should be abandoned altogether. Admittedly, packet radio is not everything the beautiful hobby of ham radio can give us, but for many people it is one of the most fascinating parts of it. And, if we keep on talking with each other, there should be room for us all.

"vy 73 and happy packeting"

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Submissions for publication in *Gateway* are welcome. You may submit material via the US mail to:

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or electronically, via CompuServe to user ID 70645,247. Via telephone, your editor can be reached on evenings and weekends at 203-879-1348 and he can switch a modem on line to receive text at 300, 1200 or 2400 bit/s.

The deadline for each issue of *Gateway* is the Saturday preceding the issue date (which is typically a Friday).

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Gateway: The ARRL Packet Radio Newsletter is published by the:

American Radio Relay League
225 Main Street, Newington, CT 06111

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Gateway Circulation

Subscriptions are available to ARRL members and nonmembers, at the following rates:

For 25 issues of *Gateway*:
In the US
ARRL Member $6.00
Nonmember $9.00
In the US, Canada and Mexico by First Class mail
ARRL Member $11.00
Nonmember $14.00
Elsewhere by Airmail
ARRL Member $14.00
Nonmember $17.00

Prices are subject to change without notice. Remittance must be in US funds, and checks must be drawn on a bank in the US.

Gateway: The ARRL
Packet Radio Newsletter
American Radio Relay League
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Newington, CT 06111

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